BSCW AS A MANAGED LEARNING ENVIRONMENT FOR INTERNATIONAL IN-SERVICE TEACHER EDUCATION

By

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ABSTRACT

Fiste is a three year Comenius project based on a need for innovative and effective ideas for in-service teacher education. The Fiste project is funded by the European Comenius and deals with the use of new web based educational technologies for teaching in-service teachers in Europe. The Fiste's main task is to create a common in-service teachers' course as a new way to provide in-service teacher education based on ICT. The participants are from five countries Finland, Romania, Iceland, Latvia and Spain. The participants used an on-line platform to set up a course with web-based learning tools.

The World Wide Web offers a great deal of potential in supporting cross-platform cooperative work within locally separated working groups. The BSCW has been developed as Web based groupware tool using the metaphor of joint virtual workspaces. The system is particularly practical for teaching and learning in the context of on-line education and already used by large communities for cooperation between students and teachers in distributed areas in Europe. The paper focus on the use of the BSCW, in the context of the Fiste project.

Keywords: The FISTE project, In-service teacher training, pedagogy, Managed Learning Environment, e-learning, ICT, on-line community, BSCW.

INTRODUCTION

The BSCW Shared Workspace system is an extension of a standard Web server through the server CGI Application Programming Interface. A `BSCW server' (Web server with the BSCW extension) manages a number of shared workspaces; repositories for shared information, accessible to members of a group using a simple user name and password scheme. In general a BSCW server will manage workspaces for different groups, and users may be members of several workspaces (e.g. One workspace corresponding to each project a user is involved with).

A shared workspace can contain different kinds of information such as documents, pictures, URL links to other Web pages or FTP sites, threaded discussions, member contact information and more. The contents of each workspace are represented as information objects arranged in a folder hierarchy. Members can transfer (upload) information from their machines to the workspace and set access rights to control the visibility of this information or the operations which can be performed for others. In addition, members can download, modify and request more details on the information objects by clicking on HTML links that request workspace operations from the BSCW server, which then returns a modified HTML page to the browser showing the new state of the workspace.

This paper reports the Fiste project. It also descries the BSCW, in the context of the Fiste project. Finally conclusions are made concerning the values of using such web based technologies for in-service teachers training.

1. The Fiste Project

Previous pedagogical models have failed to take into account new contextual and mobile methods of learning with the advances in technology-mediated learning. This paper attempts to put forward a pedagogical model namely future innovative in-service teacher education (FISTE). The work was sponsored by the European Union Comenius fund and directed by the University of Targoviste in Romania. The FISTE project was concerned with educational use of information and communication

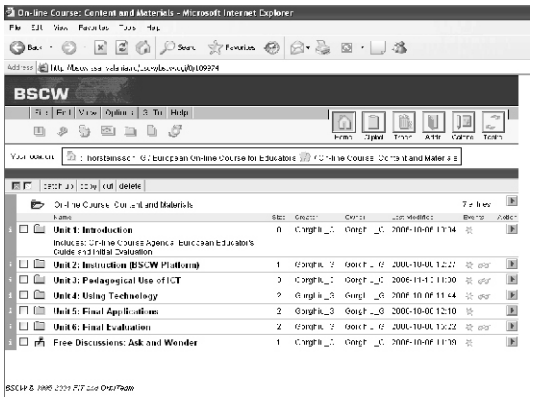

Figure 1a. Screenshot from the FISTE's BSCW Virtual Learning Environment.

technologies (ICTs), specifically with the development and dissemination of a new pedagogical model for distance learning through in-service teacher education (FISTE), in schools across Europe (The FISTE website 2006).

The strategy was based on the use of a virtual learning environment, with supporting Internet and database technologies, to facilitate Cooperative learning in the context of in-service teacher education (The FISTE website 2006). The project used the on-line Virtual Learning Environment platform BSCW as a tool to facilitate the way the participants work together. It was a continuous meeting place for them, a stable base to work from and at the same time all the undertaken activities were based on an easily accessible archive of the entire FISTE project teaching material.

The participants' built up expertise together and developed the in-service teachers' skill and knowledge through the on-line course. The whole group went through a number of separate and clearly structured stages with each other, took rotating independent responsibilities (to keep each one of us alert and motivated), pooled resources and knowledge, and made joint selections. Further more, these common personal learning experiences of the participants in the FISTE project kept the project alive and the countries got the benefits from each other.

The development of the appropriate pedagogical model focused on the practical use of information in teacher education and the educational use of ICTs. A pedagogical model and number of teaching, studying

Figure 2. Participants in the FISTE planning the on-line in-service teacher course.

and learning processes was devised and implemented, within this virtual learning environment and current research strategies were considered for their assessment and evaluation (Appelt and Mambrey, 1999).

The participants were from five countries: Romania, Finland, Iceland, Spain and Latvia. The participants had to use problem the BSCW as a platform to (PBL) build a course that integrated both face-to-face and web-based learning tools. FISTE dealt with the following issues (The FISTE website 2006):

- In-service teacher education is not efficient if it is not a real part of teachers' daily work.
- The costs for courses prohibit schools from sending their teachers to be trained in the frame of those courses.
- The future demands more and more upgrading in knowledge and teaching methods.
- In-service teachers find it difficult to be away from work for a long time.
- In-service teachers must experience learning by using ICT and ODL through CSCL environments.

The on-line course was for teachers' trainers in Europe who wanted to use ICT in their teaching in a professional and pedagogical manner. Basic skills and knowledge was given in relation to use of Internet based Cooperative Platforms (BSCW); pedagogical theories for using ICT in teaching and learning and how ICT based technologies can be implemented in teaching. The course has presented various methods for integrating face-to-face

and web-based learning tools. It was available not only through traditional Internet services (like e-mail), but was provided to teachers on the BSCW e-learning environment.

The on-line course was named ECSUT (Educational Challenges & Solutions in Using ICT). It was provided in English (EN) and it was structured in Modules (The FISTE website 2006). The total duration of the course was 42 hours from November 2006 until the end of March 2007. The On-line Course was provided in English and offered to 50 in-service teacher educators from different parts of Europe. They could register from different countries according to their location and needs for tutoring. However, the course was hold in English and was open to teacher trainers from whole Europe. The course duration was 42 hours, and the content based on the following units (The FISTE website 2006):

2. The BSCW

The BSCW platform is based on collaboration through shared workspaces over the Internet (Carmichael and Honour 2000). Shared workspaces permits storage of documents and sharing information within a group. It is integrated with an occasion mechanism to give each user an awareness of other activities within the platform. It consists of many possibilities, e.g., discussions forum, management of documents, group management, search for different features and numerous of others (he BSCW homepage 2007). The platform is first and foremost designed to sustain self-organising groups.

1. Introduction:

1.1. Tutor's Guide.

1.2. Student's Guide.

1.3. Initial Evaluation.

2. Instruction (Developing Basic Skills in Cooperative Platforms - BSCW):

2.1. The BSCW Cooperative Platform. Registration. (2 Hours).

2.2. Sharing Workspace and Discussion (4 hours).

3. Pedagogical Use of ICT in Teaching and Learning

3.1. Pedagogical Theories Supporting the Use of ICT (5 hours).

3.2. Pedagogical Use of ICT (5 hours).

4. Using Technology

4.1. Screen Capturing, Video Editing and Narrating PowerPoint Presentations with Camtasia Studio (8 hours).

4.2. The Videoconference - iVisit (3 hours).

4.3. Meetings in Virtual Reality with SmartMeeting (4 hours).

5. Implementation

5.1. Models for Implementation in the Classroom (1 hour).

6. Final Product

6.1. Implementation Project Script (Design a Unit Using One or More Presented Technologies) (10 hours).

7. Final Evaluation

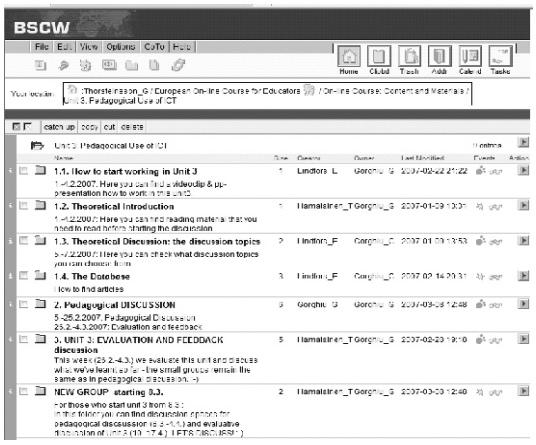

Figure 1b. A BSCW workspace including on-line course material.

The development of the BSCW platform has mostly been funded by the European Union through the WWW project and the CESAR project of the EU's Telematics Applications Programme (Carmichael and Honour 2000). Collaborators of these projects helped to develop the platform.

The BSCW is based on the idea of a "shared workspace," in which the members of a group set up for organising and manage their work (see Figure 1a-1c). A collective workspace in the BSCW is a database for shared information and accessible by the members of the group (The BSCW homepage 2007). They have to use a user name and password to enter the workspace. A BSCW server manages a many such workspaces for different groups, and users may be members of a number of workspaces (e.g., one workspace corresponding to each project a user is involved with). A workspace can hold information such as images, documents, links to Web pages or FTP sites, threaded discussions, member contact information, and more (Carmichael and Honour 2000). The contents of a workspace are shown as

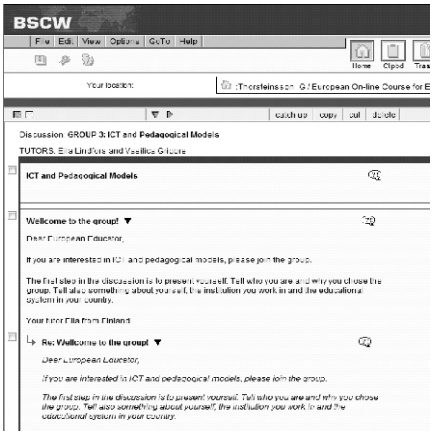

Figure 1c. The BSCW on-line discussion forum.

information objects arranged in a folder hierarchy (Figure 1a-1c).

Students and teachers can upload information from their computers to a workspace and set access privileges to manage the visibility of the information and the manoeuvres that can be performed by others (Ellis, Gibbs, and Rein 1991). Participants can download, alter, and ask for more details on the information matter by clicking on HTML links to ask for workspace operations from the BSCW server (The BSCW homepage 2007). After each action the server returns a new HTML page demonstrating the new status of the workspace (see figure 1a-1c).

Permission to manage the workspace is given by the buttons at the top of the page and the text HTML appears under every item. The former function on the present folder is shown, so that "add URL" will return an HTML form for specifying the name and the URL of a URL link object to be added to the current folder, while the latter carry out functions on each object, such as "rename," "edit description,". As a shortcut, the check-boxes to the left of every object, in together with the buttons on top of the list of objects or below permit operations on various object selections.

3. Discussion of Observations

This data collection took place over a two year period (cohorts 06 and 07) when such resources were developed and implemented. Such hypermedia-based learning resources were developed by the author and include text, graphics, video and sound based media.

Figure 3. Teacher trainers in the Fiste project setting up discussion on the BSCW on-line discussion forum.

The work reported here focuses on the use of the BSCW to support face to face learning. The authors uploaded all relevant teaching and learning resources onto the MLE for accessibility by the students on this module. Moreover, internet-based learning resources and assessments, in the form of pre-written computer programs and circuit building projects, were developed by the author, to enable the teacher trainees to gauge their knowledge and understanding at staged points through the tutorial and laboratory sessions within the module.

Through observation and evaluation it was found that these resources enabled the teacher trainees to work at their own pace through such tutorials without the fear that they may be falling behind the scheduled milestones and learning outcomes in the module. This provided with differences in learning rates and styles among the group of students. Using learning technologies played a significant role in putting into practice what had been learned in the classroom. This approach enabled the teacher trainees to manage their learning in an organised and structured manner; the hypermedia-based approach tends to appeal to students as they have become quite accustomed with using the internet as a research and learning resource.

The BSCW managed learning environment contains all the lecture slides and notes for the students to relate the theoretical foundations of using technologies in learning. It was also found that students tended to explore the subject further than was done before the implementation of this approach to teaching and learning. There have been advantages in utilising these approaches to the delivery of this module.

Evaluation of this module was undertaken by administering a questionnaire to both year groups. This

questionnaire sought to elicit learners' views and responses with regard to a number of issues relating to the use of the BSCW server, the approach to teaching and learning on this module and the quality as well as the quantity of work required in the module. The questionnaire provided a five-point Likert scale of responses ranging from 'strongly agree' to 'strongly disagree' statements. Tables 1 and 2 show the responses to these questions. The following questions were answered by students at the end of the module:

1. Do you believe that the quantity of work was within your capabilities?
2. Do you believe that the quality of work was within your capabilities?
3. Were the learning resources appropriate in fulfilling your approach to learning on this module?
4. Did the delivery of this module encourage independent learning (albeit much of the assessment was done in groups of two)?
5. Were the laboratories within (or properly stretched) your capabilities?

As can be seen by comparing responses in Tables 1 and 2 it is evident that for questions 1, 2, and 5 there is a notable shift in responses towards 'agree' and 'strongly agree'. Nevertheless, for question 1, two respondents in cohort 06 disagreed that the quantity of work was within their capability.

The reason for this is that in cohort 6, the students were initially directed to learn programming by typing instructions into the text editor which proved to be very

Question numbers

Cohort 06	1	2	3	4	5
Strongly Agree	-	-	2	5	-
Agree	4	8	5	3	8
Neutral	3	3	3	3	3
Disagree	4	-	1	-	-
Strongly Disagree	-	-	-	-	-

Table 1. Questionnaire responses (cohort 06 n=11)

Question numbers

Cohort 07	1	2	3	4	5
Strongly Agree	1	2	2	2	2
Agree	11	12	4	7	11
Neutral	-	-	8	3	1
Disagree	2	-	-	2	-
Strongly Disagree	-	-	-	-	-

Table 2. Questionnaire responses (cohort 07 n=14)

time consuming, prone to errors and non-productive. The method of 'reverse engineering' was deployed to overcome such drawbacks and as such, cohort 06 learned programming using reverse engineering without inputting instructions in the 'editor'. It is of interest to note that for question 3 eight respondents in cohort 06 provided a neutral response. Possibly for this question they could neither agree nor disagree with their responses.

The self-assessment problems enabled students to find their own level of skill and efficiency in undertaking the learning tasks. Nevertheless, there were some problems encountered in issuing assignment-based problems too early during the module. For example, many students attempted the assignment before completing the learning tasks and exercises

Conclusion

The emphasis of the BSCW system in the Fiste project was on flexible information sharing within a distributed work group on in-service teacher trainers in Europe. It was independent of the type of information to be shared and the purposes to which it was put. The use of the BSCW was based on general mechanisms for document upload, version management, and so on, integrated with features like (server-side) document format conversion. This work was undertaken in the context of academic pedagogical strategy for Web-based distributed authoring.

The on-line course was for teachers' trainers that wanted to use ICT in their teaching in a professional and pedagogical manner. Basic skills and knowledge was given in relation to use of Internet based Collaborative Platforms (BSCW); pedagogical theories for using ICT in teaching and learning and how ICT based technologies can be implemented in teaching.

The course presented methods for integrating face to face and web-based learning tools. It was available not only through traditional Internet services (like e-mail), but mainly provided for teachers on the BSCW e-learning environment. In the projects framework, the teachers got manuals, tutorials, and documents related to the on-line course, and also software that combined chats, news, whiteboards, tutors on-line, bulletin boards, meeting

points, etc, in order to share all the needed information.

Currently, pedagogical and technical orientations in respect of education and new technologies for educational activities are separated (Page and Thorsteinsson 2003). The development of learning materials and pedagogies requires significant and multidisciplinary expertise. While new technology forms pedagogical strategies and development of learning materials, pedagogical processes reform the development of technology.

The most important footstep towards the future needs of using new technologies in education would be to build up communities and practices. The Fiste project offers an example of how this could be realised, although at present the project is temporal. The experience from the Fiste could be implemented for further activities inside of the European educational system has no formal continuity.

New technologies for education are however expensive and the technical development of electronic learning environments is determined by institutional assessment for cost effective solutions, facilitating simple management and upholding (Page and Thorsteinsson 2003). These considerations are understandable but should not rule the choice for new ways for teaching and learning.

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Dr. Tom Page, is graduated from Napier in 1988 with a degree in 'Technology with Industrial Studies'. He has also worked as a Research Scholar at Napier Polytechnic as a Research Assistant and worked between there and the Engineering Design Research Centre (EDRC) at the University of Glasgow. In 1992, he attained his M.Phil by research in engineering design methodology for his work at the Engineering Design Research Centre. Tom worked as a Computer-Aided Engineering at the University of Hertfordshire. In 1995, he became a Chartered Engineer with full membership of the Institution of Electrical Engineers (IEE) and was promoted to senior lecturer in Computer-Aided Design and Manufacturing. Tom pursued his research in Electronics Design for Manufacturing and received his PhD in 2001. He is also a full member of the Institute of Learning & Teaching (ILT). His research interests include electronics design tools, electronics design for manufacturing and assembly and engineering/ technological education.